Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554



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| In the Matter of | ) | |
| | ) | |
| Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range | ) | ET Docket No. 98-206 |
| | ) | RM-9147 |
| | ) | RM-9245 |
| Amendment of the Commission's Rules to Authorize Subsidiary Terrestrial Use of the 12.2-12.7 GHz Band by Direct Broadcast Satellite Licensees and Their Affiliates | ) | |

# REPLY COMMENTS OF GE AMERICAN COMMUNICATIONS, INC.



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April 14, 1999

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## EXECUTIVE SUMMARY

With the exception of SkyBridge, every party to file comments in this proceeding agrees that the *NPRM's* proposed pfd limits, which are based on the provisional limits that came out of WRC-97, would not adequately protect GSO FSS and BSS operators in the Ku-band.

When SkyBridge first proposed to use the Ku-band for its NGSO FSS system, it did so with the understanding that NGSO FSS entry should not be permitted to harm GSO FSS, BSS and other systems already operating in that band. Based on all of the technical data submitted thus far in this proceeding -- as well as in the JTG 4-9-11 process -- it is clear that the *NPRM's* proposed pfd limits do not meet this standard.

There is general consensus among the commenters that in order to adequately protect GSO systems in the Ku-band, aggregate pfd limits for NGSO FSS operations will need to be established. There is further consensus that these aggregate limits will have to be apportioned and independently enforced through rigid single entry pfd limits if they are to be maintained.

Since WRC-97, JTG 4-9-11 has refined the ITU's approach to establishing pfd limits for the Ku-band, and it now recognizes the compelling need for aggregate limits apportioned and enforced by single entry pfd limits. JTG 4-9-11 is also in the process of developing pfd masks that incorporate a wide variety of antenna sizes while also supporting the establishment of aggregate pfd limits. The

Commission's proposed adoption of the underdeveloped and untested WRC-97 limits would therefore be woefully premature and completely inadequate.

Once aggregate and single entry pfd limits for NGSO FSS providers are established, the Commission should amend its rules so that GSO FSS operators are permitted to access any spectrum, under the same conditions authorized for NGSO FSS operation. This is important because GSOs and NGSOs will be competing for similar customers. The Commission should be cautious, however, in assigning a burden sharing arrangement, as NGSO FSS providers are the primary beneficiaries of Ku-band sharing and should therefore bear the majority of costs. Finally, the Commission should reject Boeing's request to provide ancillary mobile services in the Ku-band as outside the scope of this proceeding.

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| Affiliates | ) | |

## REPLY COMMENTS OF GE AMERICAN COMMUNICATIONS, INC.

GE American Communications, Inc. ("GE Americom"), by its attorneys, hereby responds to the comments filed pursuant to the Commission's *Notice of Proposed Rulemaking* in the above-referenced proceeding.[1]

## INTRODUCTION

With the exception of SkyBridge, every party that filed comments in this proceeding agrees that the *NPRM's* proposed pfd limits, which are based on the provisional pfd limits that came out of WRC-97, would not adequately protect GSO FSS and BSS operations in the Ku-band. These parties also agree that

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1 *In the Matter of Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range, et al.*, ET Docket No. 98-206, *Notice of Proposed Rulemaking,* FCC 98-310 (rel. Nov. 24, 1998) (*"NPRM"*).

(1) aggregate pfd limits are needed to ensure that GSO FSS and BSS systems are not harmed by the initiation of NGSO FSS operations in the Ku-band; and (2) that these aggregate limits should be apportioned and independently enforced by rigid single entry pfd limits.

When SkyBridge first proposed to use the Ku-band for its NGSO FSS system, it did so with the understanding that NGSO FSS entry should not be permitted to harm GSO FSS, BSS and other systems already operating in that band -- including both current and future services provided by those systems. Based on all of the technical data submitted thus far in this proceeding (as well as in the JTG 4-9-11 process), it is clear that the *NPRM's* proposed limits do not meet this standard.

Since WRC-97, JTG 4-9-11 has refined the ITU's approach to establishing pfd limits for the Ku-band. With the benefit of this considered analysis, strong consensus exists that aggregate pfd limits -- apportioned and enforced by rigid single entry pfd limits based on "N" -- are crucial to ensure that NGSO FSS providers do not collectively generate so much interference as to impair GSO systems operating at Ku-band.

As the JTG 4-9-11 process progresses, so too do the methods through which pfd limits are calculated and verified for NGSO FSS systems. For instance, Working Party 4A is developing pfd masks to encompass all relevant antenna sizes. The parties are now working on the calculations necessary to implement this objective. Furthermore, Hughes, itself an applicant for two NGSO FSS systems,

reports that its systems are capable of operating at limits far more stringent than those proposed in the *NPRM*. These developments, which have emerged well after provisional pfd limits were adopted at the close of WRC-97, strongly suggests that the *NPRM's* proposed limits reflect premature and incorrect assumptions and must be substantially revised.

Once the Commission establishes valid pfd limits for NGSO FSS entry into the Ku-band, it must amend its rules so that GSO FSS operators are permitted to access any spectrum, under the same conditions, that is authorized for NGSO FSS operation. For instance, the Commission should lift its "international systems only" restriction for GSO FSS providers in the 10.7-11.7 GHz and 12.75-13.25 GHz bands if NGSOs are permitted to use this spectrum to provide domestic service. The Commission should also amend its rules on access to the 13.75-14.0 GHz band so that, if NGSO FSS providers are given access to that band, GSO FSS operators are able to access it under the same minimum uplink power restrictions proposed for NGSO FSS providers. This is important because the two types of systems will be competing for similar customers.

The Commission should be cautious, however, in assigning a burden sharing arrangement. NGSO FSS providers are the primary beneficiaries of Ku-band sharing and should therefore be required to bear the majority of costs associated with its implementation.

Finally, the Commission should reject Boeing's proposal that NGSO FSS providers be permitted to provide ancillary mobile services in the Ku-band.

Boeing's proposal is well outside the scope of this proceeding, and the record is woefully undeveloped with respect to this issue.

## I. THE RECORD DEMONSTRATES THAT THE *NPRM'S* PROPOSED PFD LIMITS ARE INADEQUATE AND THAT AGGREGATE PFD LIMITS ARE NEEDED

With the exception of SkyBridge, every party that filed comments in this proceeding agrees that the *NPRM's* proposed pfd limits would not adequately protect GSO FSS and BSS operations in the Ku-band.[2] For instance, PanAmSat states that, based on the technical studies presented thus far, it is clear that "the WRC-97 limits are inadequate to protect GSO FSS systems from interference caused by NGSO FSS networks."[3] Similarly, the Satellite Coalition finds that "technical studies conducted after WRC-97 demonstrate that the [NPRM's] proposed pfd limits are insufficient to protect GSO FSS and BSS links."[4] According to Telesat Canada, if the *NPRM's* proposed pfd limits are adopted, interference caused by NGSO FSS operations in the Ku-band would be so strong that it would likely harm GSO FSS and BSS transmissions in Canada as well.[5]

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[2] Boeing advocates that "substantial deference" be given to the technical studies prepared by the ITU-R; however, it warns that the Commission should not "rubber stamp" the technical outputs of JTG 4-9-11 and other ITU-R technical groups. Comments of The Boeing Company ("Boeing") at 7-9.

[3] Comments of PanAmSat Corporation ("PanAmSat") at 8.

[4] Comments of The Satellite Coalition ("Satellite Coalition") at 2.

[5] Comments of Telesat Canada at 2.

Operators of FSS systems are not the only ones who find the *NPRM's* proposed pfd limits for NGSO FSS entry unsuitable. The entire DBS industry is also opposed to the them. For example, EchoStar states that "[i]f adopted, the [*NPRM's* proposed] power limits would not adequately protect either current or future FSS, let alone DBS."[6] DirecTV indicates that the adoption of the Commission's proposed pfd limits will hinder the evolution of DBS service.[7] A variety of other types of service providers -- from cable programmers, to messaging and tracking agents, to fixed wireless providers -- also agree that the entry of NGSO FSS systems under the *NPRM's* proposed pfd limits poses a serious threat to their operations.[8] In light of this unanimous viewpoint, the Commission should comprehensively reevaluate its approach to permitting NGSOs to enter the Ku-band.

In addition to registering their opposition to the *NPRM's* proposed pfd limits, the majority of commenters also agree that enforcing an aggregate pfd cap on all NGSO FSS transmissions, with additional reinforcement through rigid single

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6 Comments of EchoStar Communications Corporation at 4. EchoStar further notes that the *NPRM's* proposed limits would not even protect the smaller 45 cm dishes widely-deployed in the 12 GHz band, and would produce unacceptable levels of interference with the largest DBS dishes deployed in rural and remote areas like Alaska and Hawaii where DBS service is particularly valuable. *Id.*

7 Comments of DirecTV, Inc. at 2.

8 *See, e.g.,* Comments of Home Box Office and Turner Broadcasting System, Inc. at 4-5; Comments of Qualcomm Incorporated at 2-4; Comments of SBC Communications, Inc. at 4; Comments of the Association of American Railroads at 2; Comments of Petroleum Communications, Inc. at 2-3.

entry limits, is vital. For instance, PanAmSat states that "it is essential that the Commission adopt aggregate epfd and apfd limits and develop a reliable methodology for allocating these aggregate limits across individual systems."[9] The Satellite Coalition similarly finds that the Commission "should start by defining what really matters -- aggregate limits -- and then define a means for allocating those limits across NGSO systems."[10] Even Boeing, which to some degree sides with SkyBridge by advocating "substantial deference" to the ITU-R technical studies, agrees that adopting aggregate pfd limits is essential to appropriately allocating interference among NGSOs.[11]

Based on all of the technical studies submitted thus far in this proceeding (as well as in the JTG 4-9-11 process), it is clear that the pfd limits proposed by the United States at the most recent meeting of JTG 4-9-11 in Long Beach (which consist of aggregate rather than single entry pfd limits), or a revised version of these limits, as currently being developed in Working Party 4A, are crucial to protect existing and future GSO operations in the Ku-band.[12] This approach is preferred by a number of commenters, and represents the best way of

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9 PanAmSat at 13.

10 Satellite Coalition at 5.

11 Boeing at 52-55.

12 *See Proposed Revision to Resolution 130 Provisional EPFD and APFD Limits in the Resolution 130 14/11 GHz Bands,* Document 4-9-11/342, International Telecommunications Union, Radiocommunication Study Groups, Joint Task Group 4-9-11 (Jan. 13, 1999) (including *Addendum 1, Corrigendum 2, and Addendum 2*).

ensuring that NGSO FSS operations in the Ku-band do not begin to encroach on GSO systems.[13] The U.S.-proposed pfd limits are optimal because they are based on a consideration of worldwide links and link margins (which exclude the driest rain regions, *i.e.,* A and B), not "sensitive" links. This ensures that they are derived from generic guidelines, and that they will be fair for all carriers.

There has been some suggestion that in order to accommodate the increase in interference coming from NGSO FSS systems, GSO FSS earth stations could simply increase their power transmission levels.[14] There has also been some suggestion that GSO FSS providers would only have to increase their power transmission levels for a few links.[15] Neither of these contentions is accurate. The operational links that will be most affected by NGSO FSS interference are VSAT remote-to-hub links where the terminal and hubs are in relatively dry climates. In many cases the VSATs, which use state-of-the-art solid state transmitters, are already operating at or close to their maximum levels. Therefore, there is little or no margin through which their power can be increased. Moreover, thousands of VSAT terminals are or will be affected, not the "extremely few in number" that SkyBridge claims.[16]

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13 *See, e.g.,* PanAmSat at 9, Appendix A.

14 Comments of SkyBridge at 43.

15 *Id.*

16 *Id.*

In addition, any suggestion that there is "excess margin" in most of these links is incorrect. GSO FSS systems are designed to utilize only the power necessary to achieve required bit error rates for the required availability, taking into account rain, interference, and pointing losses, among other things. If any excess margin existed, it would (for power-limited transponders) decrease transponder capacity, which is not in the service provider's interest. Protecting GSO FSS providers from harmful NGSO interference will therefore require more than minor technical adjustments on the part of GSO FSS systems.

At least one potential NGSO FSS provider, Hughes, has come forward to note that, despite the more stringent pfd standards of the U.S. submission to JTG 4-9-11, "it has been able to design, and has filed application for, two NGSO FSS systems at Ku-band that can operate within these more stringent standards while providing full service capabilities to end users."[17] Hughes's ability to design NGSO FSS systems that can accommodate the more stringent standards of the U.S. submission belies any assertion on the part of SkyBridge that the tightening of the *NPRM's* pfd limits, or the WRC-97 limits on which they are based, would preclude NGSO FSS systems from operating in the Ku-band.

Since they were proposed at WRC-97, the provisional pfd limits upon which the *NPRM's* proposed pfd limits are based have been subject to intense scrutiny and have evolved into something more closely resembling the aggregate limits sought by the U.S. In fact, every participant in the ITU process now agrees

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17 Comments of Hughes Communications, Inc. at 2-3.

that masks or curves should be created for pfd limits that encompass all antenna sizes. This mask or curve, which would support the implementation of aggregate limits, is being developed by the participants of Working Party 4A for presentation at the next JTG 4-9-11 meeting in Geneva in late May of 1999. In light of the successful efforts being made to amend and refine the WRC-97 limits so they are suitable to everyone, it would be entirely inappropriate for the Commission to adopt the *NPRM's* proposed pfd limits at this time.

## II. THE COMMISSION SHOULD GRANT GSO FSS PROVIDERS THE SAME SPECTRUM RIGHTS AS NGSO FSS PROVIDERS

Once the Commission establishes valid pfd limits for NGSO FSS entry into the Ku-band, it is essential that the Commission amend its rules so that NGSO FSS operators do not hold a competitive advantage over their GSO FSS counterparts. This is essential because both types of systems will be competing for similar customers throughout the United States.

For instance, if, as SkyBridge proposes, NGSO FSS providers are permitted to provide domestic service in the 10.7-11.7 GHz and 12.75-13.25 GHz bands, the Commission should lift its "international systems only" restriction for GSO FSS providers in these bands. The 10.7-11.7 GHz and 12.75-13.25 GHz bands are internationally allocated for domestic use. Where possible, the Commission should strive to apportion spectrum in a manner that is consistent with allocations throughout the world. It would be patently unfair for the Commission to permit NGSO FSS providers to use this spectrum for domestic service while locking out all

of the GSO FSS operators with whom they compete. This is an instance in which the ITU's allocations makes sense, and the Commission should seek to replicate them without playing favorites.

Similarly, if, as SkyBridge proposes, the Commission permits NGSO FSS gateway uplink operations in the 13.75-14.0 GHz band, it should also permit GSO FSS providers to use that band at the same reduced power levels proposed for NGSOs.[18] As stated earlier, once NGSO FSS providers are permitted to initiate their operations in the Ku-band, they will be competing with GSO FSS providers for similar customers in the domestic market. There is no reason NGSO FSS providers should be given a competitive advantage by being permitted to use spectrum that is not available to GSO FSS licensees. The Commission should instead strive to achieve regulatory parity between GSO and NGSO FSS systems in the area of spectrum availability.

Notwithstanding this fact, it is eminently clear that burden sharing as a result of NGSO FSS entry into the Ku-band should not be equal. GSO FSS providers have already had to invest significant time and resources, as well as incur great expense, in order to protect themselves from the risk of harmful interference as a result of proposed NGSO FSS entry into the Ku-band. The crux of this proceeding, as well as the ITU process, will ultimately benefit NGSO FSS providers and impose burdens on other operators. NGSO FSS providers are the ones who will be given access to new markets at the expense of GSO FSS providers and others,

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18 SkyBridge at 8.

who have to make do with diminishing spectrum and an increasingly crowded arc. It is therefore clear that NGSO FSS providers should bear the brunt of the burden resulting from their entry into the Ku-band.

## III. NGSO FSS SYSTEMS SHOULD NOT BE AUTHORIZED TO PROVIDE MOBILE SERVICES IN THIS PROCEEDING

In its comments, Boeing suggests that in order to maximize the range of innovative services that can be provided to the public, the Commission should permit NGSO FSS systems to provide ancillary mobile operations on a non-interference basis in Ku-band.[19] According to Boeing, this would help alleviate the severe shortage of spectrum that is currently available for consumer services, and support economic development and job growth.[20]

Boeing's suggestion is well outside the scope of this proceeding and should be rejected by the Commission. The goal of this proceeding is to develop parameters pursuant to which NGSO FSS providers will be able to provide satellite service to fixed earth stations throughout the United States without interfering with GSO operations in the Ku-band. This proceeding is not about the provision of mobile operations by NGSO FSS providers. No record has been developed on this subject, and the parties have not had an adequate opportunity to comment on the types of services NGSO FSS systems may be capable of providing. The Commission

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19 Boeing at 75.

20 *Id.*

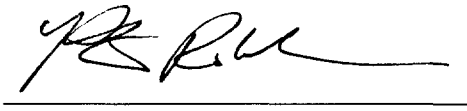
should therefore dismiss Boeing's suggestion, and, only if warranted, address the matter in a separate proceeding.

## CONCLUSION

For the reasons stated above, the Commission should reject the pfd limits proposed in the *NPRM*, and instead adopt aggregate pfd limits similar to the ones submitted by the United States at the most recent meeting of JTG 4-9-11, or, alternatively, similar to any consensus reached in the current Working Party 4A process. The Commission should also strive to achieve regulatory parity between GSO and NGSO FSS providers in the area of spectrum availability. Finally, the Commission should reject Boeing's proposal to permit NGSO FSS systems to provide ancillary mobile operations in the Ku-band as outside the scope of this proceeding.

Respectfully submitted,

GE AMERICAN COMMUNICATIONS

By: 

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April 14, 1999

## CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing Reply Comments of GE American Communications, Inc. in ET Docket No. 98-206 was served by hand delivery (indicated by "*") or U.S. First Class mail, this 14th day of April, 1999 on:

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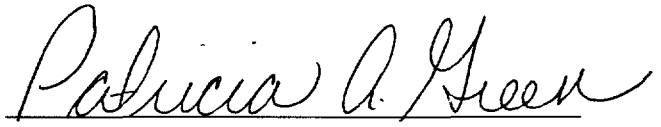

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